

WHAT IS CLAIMED IS:

1. A data recording method of scrambling input data based on Maximum-length sequences that are generated by
5 n-degree primitive polynomials, comprising:

a selecting process for selecting a specific Maximum-length sequences, based on recording position data, from among Maximum-length sequences that are generated by a plurality of primitive polynomials of said
10 n-degree primitive polynomials having m number ($m < n$) of non-zero coefficients; and

a scrambling process for scrambling input data according to the Maximum-length sequences to generate recording data.

2. A data recording method of scrambling input data based on Maximum-length sequences that are generated by
n-degree primitive polynomials, comprising:

a selecting process for selecting a specific
20 Maximum-length sequences is selected, based on recording position data, from among Maximum-length sequences that are generated by a plurality of primitive polynomials of said n-degree primitive polynomials whose k number ($k < n$) of coefficients all become zero in order starting from the
25 coefficient of the largest degree; and

a scrambling process for scrambling input data according to the Maximum-length sequences to generate

recording data.

3. A data recording method of scrambling input data based on Maximum-length sequences that are generated by
5 n-degree primitive polynomials, comprising:

a selecting process for selecting a specific Maximum-length sequences is selected, based on recording position data, from among a specified number of said Maximum-length sequences that are generated by two
10 arbitrary primitive polynomials of said n-degree primitive polynomials and from which combinations having large correlation between pairs of Maximum-length sequences have been excluded; and

a scrambling process for scrambling input data
15 according to the Maximum-length sequences to generate recording data.

4. The data recording method of claim 1, wherein;

said recording data are recording in order on the
20 tracks of a disk-shaped recording medium, and different Maximum-length sequences are selected and scrambling is performed for adjacent tracks.

5. The data recording method of claim 1 wherein;

25 the Maximum-length sequences, which are generated by the sixteen primitive polynomials given by the 14-degree

primitive polynomials $H(x)$ that are expressed by combination of the output x^{14} to x^0 of the Maximum-length sequences,

$$H(x) = x^{14} + x^{10} + x^6 + x^1 + 1$$

$$5 \quad H(x) = x^{14} + x^8 + x^6 + x^1 + 1$$

$$H(x) = x^{14} + x^{11} + x^6 + x^1 + 1$$

$$H(x) = x^{14} + x^6 + x^4 + x^1 + 1$$

$$H(x) = x^{14} + x^{12} + x^9 + x^2 + 1$$

$$H(x) = x^{14} + x^{12} + x^2 + x^1 + 1$$

$$10 \quad H(x) = x^{14} + x^9 + x^7 + x^2 + 1$$

$$H(x) = x^{14} + x^{12} + x^5 + x^2 + 1$$

$$H(x) = x^{14} + x^5 + x^3 + x^1 + 1$$

$$H(x) = x^{14} + x^8 + x^3 + x^2 + 1$$

$$H(x) = x^{14} + x^9 + x^8 + x^3 + 1$$

$$15 \quad H(x) = x^{14} + x^{11} + x^4 + x^3 + 1$$

$$H(x) = x^{14} + x^{11} + x^{10} + x^9 + 1$$

$$H(x) = x^{14} + x^{12} + x^{11} + x^6 + 1$$

$$H(x) = x^{14} + x^{11} + x^6 + x^5 + 1$$

$$H(x) = x^{14} + x^{11} + x^4 + x^1 + 1$$

20 can be selected and set.

6. A data recording apparatus for scrambling input data based on Maximum-length sequences that are generated by n -degree primitive polynomials, said

apparatus comprising:

a selecting device which selects a specific Maximum-length sequences based on recording position data from among Maximum-length sequences that are generated by a plurality of primitive polynomials of said n-degree primitive polynomials having m number ($m < n$) of non-zero coefficients; and

a scrambling device which scrambles input data according to the Maximum-length sequences to generate recording data.

7. The data recording apparatus according to claim 6 further comprising;

a feedback switching device for selecting m number of output bits that correspond to said Maximum-length sequences; and

a switching device which switches the feedback bit.

8. A data recording apparatus for scrambling input data based on Maximum-length sequences that are generated by n-degree primitive polynomials, said apparatus comprising;

a selecting device which selects a specific Maximum-length sequences based on recording position data from among Maximum-length sequences that are generated by a plurality of primitive polynomials of said

n-degree primitive polynomials whose k number ($k < n$) of coefficients all become zero in order starting from the coefficient of the largest degree; and

a scrambling device which scrambles input data according to the Maximum-length sequences to generate recording data.

9. The data recording apparatus according to claim 8, said apparatus further comprises a dividing and executing device for dividing and executing the scrambling calculation process, which corresponds to one degree of said primitive polynomials, in a plurality of stages.

10. A data recording apparatus for scrambling input data based on Maximum-length sequences that are generated by n-degree primitive polynomials, said apparatus comprising:

a selecting device for selecting a specific Maximum-length sequences based on recording position data from among a specified number of said Maximum-length sequences that are generated by two arbitrary primitive polynomials of said n-degree primitive polynomials and from which combinations having large correlation between pairs of Maximum-length sequences have been excluded; and

a scrambling device which scrambles input data according to the Maximum-length sequences to generate

recording data.

11. The data recording apparatus of claim 6, which further comprising;

5 a recording device which records said recording data in order on the tracks of a disk-shaped recording medium; and

10 a selecting and performing device which selects different Maximum-length sequences and performs scrambling for adjacent tracks.

12. The data recording apparatus of claim 6, which further comprising;

15 a selecting and setting device which can select and set the Maximum-length sequences, which are generated by the sixteen primitive polynomials given by the 14-degree primitive polynomials $H(x)$ that are expressed by combination of the output x^{14} to x^0 of the Maximum-length sequences,

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$$H(x) = x^{14} + x^{10} + x^6 + x^1 + 1$$

$$H(x) = x^{14} + x^8 + x^6 + x^1 + 1$$

$$H(x) = x^{14} + x^{11} + x^6 + x^1 + 1$$

$$H(x) = x^{14} + x^6 + x^4 + x^1 + 1$$

$$H(x) = x^{14} + x^{12} + x^9 + x^2 + 1$$

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$$H(x) = x^{14} + x^{12} + x^2 + x^1 + 1$$

$$H(x) = x^{14} + x^9 + x^7 + x^2 + 1$$

$$H(x) = x^{14} + x^{12} + x^5 + x^2 + 1$$

$$H(x) = x^{14} + x^5 + x^3 + x^1 + 1$$

$$H(x) = x^{14} + x^8 + x^3 + x^2 + 1$$

$$5 \quad H(x) = x^{14} + x^9 + x^8 + x^3 + 1$$

$$H(x) = x^{14} + x^{11} + x^4 + x^3 + 1$$

$$H(x) = x^{14} + x^{11} + x^{10} + x^9 + 1$$

$$H(x) = x^{14} + x^{12} + x^{11} + x^6 + 1$$

$$H(x) = x^{14} + x^{11} + x^6 + x^5 + 1$$

$$10 \quad H(x) = x^{14} + x^{11} + x^4 + x^1 + 1$$

13. A data reproduction method of descrambling input data based on Maximum-length sequences that are generated by n-degree primitive polynomials, comprising:

15 a descrambling process for descrambling said input data that were scrambled by the data recording method of the claim 1 by Maximum-length sequences which were selected during scrambling; and

a generating process for generating reproduced data.

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14. A data reproduction apparatus for descrambling input data based on Maximum-length sequences that are generated by n-degree primitive polynomials, said apparatus comprising:

25 a descrambling device which descrambles said input

data that were scrambled by the data recording method of the claim 1 by Maximum-length sequences, which were selected during scrambling; and

a generating device which generates reproduced data.

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